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Environmental self-regulation in favourite places of Finnish and Hungarian adults

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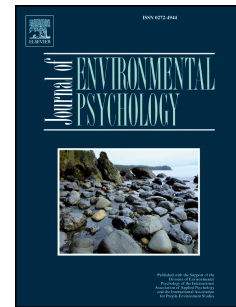
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**CRediT author statement**

Kalevi Korpela: conceptualization, methodology, investigation, resources, data curation, writing-original draft, review & editing, project administration; Tapio Nummi: methodology, formal analysis, writing – review & editing; Mikko Korhonen: methodology, formal analysis, visualization, writing – review & editing; Tamas Martos: investigation, data curation, writing – review & editing; Viola Sallay: investigation, data curation, writing – review & editing

## **Environmental self-regulation in favourite places of Finnish and Hungarian adults**

Running title: Self-regulation in favourite places

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## Abstract

The aim of the study was to investigate the benefits of favourite physical places for well-being based on the idea of environmental self-regulation. It proposes that everyday favourite places are used as a “coping mechanism” to enhance subjective well-being through reflection, emotion regulation and withdrawal. We investigated the connection between reasons for visiting the favourite place, consequent experiences and perceived well-being (satisfaction with life and perceived health) through structural equation modelling. We also analysed the reversed model, where well-being affects the reasons for visiting and experiences in favourite places. Finnish and Hungarian participants ( $N = 784$ ) answered an internet-based questionnaire. Concerning the relationships between reasons, experiences and well-being variables, all of the three reason factors (“Sad, depressed”; “Happy, well”; “Alone, reflective”) were significantly and positively related to the factor “Experiences of positive recovery of self”. This indicates that favourite places do indeed facilitate self-regulation by transforming negative cognitions and feelings into positive ones. However, positive recovery experiences were not related to well-being but distress experiences were negatively related to life satisfaction and perceived health. The reversed model revealed a top-down relation of life satisfaction with positive and negative reasons.

## Highlights:

- We investigated the self-reported benefits of favourite physical places for well-being.
- Favourite places were visited for depressed, happy and reflective reasons.
- Positive recovery of self but also distress was experienced in favourite places.
- Positive recovery experiences were not related to well-being.
- Distress experiences were negatively related to life satisfaction and perceived health.
- Life satisfaction was related to positive and negative reasons.

## 1. Introduction

The aim of the present study is to investigate the benefits of favourite physical places for well-being based on an individual's environmental self-regulation (Korpela, 1992). Well-being refers to hedonic (subjective or emotional) well-being focusing on happiness, pleasure attainment and pain avoidance and eudaimonic well-being focusing on meaning, self-realization and full functioning of the individual (Ryan & Deci, 2001). From a self-regulation perspective, people are considered as being active and making conscious and unconscious choices of and in their everyday physical settings based on preferences, emotions, memories, and habits (Russell & Snodgrass, 1987). Environmental self-regulation reflects the idea that maintaining a coherent conceptual system (through cognitive reflection) of oneself and an emotional balance between pleasure and pain is a fundamental aspect of environmental self-regulation taking place in a favourite place where reflection, emotion regulation and withdrawal are possible (Korpela, 1992). Thus, environmental self-regulation in favourite places includes reflection related to threats to self-experience and self-esteem (related to eudaimonic well-being), up- and downregulation of emotions (both mood and momentary feelings) and regulation of stress (related to hedonic well-being).

Earlier self-report research indicates that everyday favourite places are indeed visited to relieve stress and enhance subjective well-being (Jorgensen, Hitchmough & Dunnett, 2007; Newell, 1997). Places to which individuals are attached can generate psychological benefits, including perceived restoration (Ratcliffe & Korpela, 2016, 2018; Scannell & Gifford, 2017). Restorative outcomes established in restorative environments research (Hartig et al., 2014) and theories (ART by the Kaplans (1989); SRT by Ulrich et al. (1991)), i.e., relaxation, a decrease in negative and an increase in positive feelings, attentional recovery, forgetting worries and facing matters on one's mind have characterized visits to favourite places, particularly natural ones (Korpela, Hartig, Kaiser & Fuhrer, 2001).

Emotion regulation refers to the activity of coping with moods and emotional situations. This regulation includes intra- and extraorganismic factors by which emotional arousal is redirected, modified and modulated in emotionally arousing situations (Cicchetti, Ganiban, & Barnett, 1991). Thus, emotion regulation is not only an inner homeostatic mechanism but also interaction with the social and physical environment (Dodge & Garber, 1991). Mood refers to "the core of emotional feelings of a person's subjective state at any given moment" (Russell & Snodgrass, 1987, p. 247). Mood may persist or change in cycles for no apparent reason (Frijda, 1986; Russell & Snodgrass, 1987). Thus, mood refers to a tendency to feel over a longer time period or to an aggregate evaluation of the prevailing feelings over days or even months. Feelings refer to momentary short-term emotions triggered by certain reasons/stimuli.

Relatively few studies have focused on the change in mood or feelings when visiting a favourite place. Self-report evidence from Finnish adults suggests that those with high negative mood were more likely to choose natural places than other places as their favourite (Korpela, 2003). Negative feelings changed to

positive ones in natural favourite places, particularly for those with health complaints, such as headaches or chest or stomach pains (Korpela & Ylén, 2007). Positive preexisting feelings improved or remained positive after visiting the favourite place (Korpela, 2003).

There is limited evidence suggesting top-down effects (i.e. the effects of past experience, traits or psychological states) of well-being or mood on the use of environmental self-regulation (Ratcliffe & Korpela, 2016). Basically, mood affects an individual's selection of certain places, activities and experiences while there, and decisions to leave (Kerr & Tacon, 1999).

However, a detailed analysis in one and the same study of the connection between reasons to visit the favourite place and consequent experiences and well-being is still lacking. Some studies have described the various reasons for visiting favourite places among adolescents but these have remained uncharted among adults (Korpela, 1992). The importance of different types of experiences while in a favourite place is not well known. The relation of favourite place experiences to different aspects of perceived well-being is unclear. What is known, however, is that in samples from several countries the majority of everyday favourite places has been natural settings (Jorgensen et al., 2007; Laatikainen et al., 2017; Newell, 1997) and a meta-analysis suggests that nature exposure increases positive affect and decreases negative affect (McMahan & Estes, 2015). Thus, further evidence for using physical settings for emotion regulation comes from studies investigating the use of nature in general rather than specific favourite places. A Norwegian study found that using nature pictures both actively for reflection and emotion regulation when “sad/angry/annoyed or similar”, and passively as a picture on the wall to be looked at daily, improved positive mood over two weeks (Johnsen & Rydstedt, 2013). Positive mood decreased in the control group which used a picture of balloons on the wall for daily inspection. Another study among wilderness visitors in Norway found that a self-reported tendency for positive (e.g., “I go out into nature to experience positive feelings” / “... joy”) and negative emotion regulation (e.g., “I often go out into nature when I am angry” / “... sad”) in nature was positively related to restorative outcomes (of relaxation and clearing one's thoughts) after a visit to a natural area (Johnsen, 2013). The relationship between natural settings and different aspects of well-being has been observed in several studies, e.g., good perceived health has been associated with proximity to the nearest green space (Stigsdotter et al., 2010; Sugiyama, Leslie, Giles-Corti, & Owen, 2008). More green space in residential areas has been associated with lower levels of depression in a twin-study design (Cohen-Cline, Turkheimer & Duncan, 2015). Moreover, moving to greener areas has been related to greater subsequent happiness and life satisfaction over several years (Alcock, White, Wheeler, Fleming, & Depledge, 2014).

Based on these studies and existing evidence of environmental self-regulation (Korpela et al., 2018), we suggest that visiting favourite places alleviates stress but also affects emotional (subjective) well-being. The latter, according to Diener's (2000) definition, includes general life satisfaction, satisfaction with important life domains and emotional well-being with high positive affect and low levels of negative affect. In the present study, we do not include satisfaction with different life domains as measures of emotional

well-being. Rather, in addition to general life satisfaction we include perceived general health because it has a positive relationship with exposure to natural settings. Earlier studies suggest that favourite places are visited for both negative (e.g., when encountering disappointments) and positive (e.g., when experiencing happiness) reasons (Korpela, 1992). Moreover, internal feelings and thoughts referring to opportunities for reflection and restoration/recovery have been mentioned as reasons (Korpela, 1992). Earlier research suggests that both positive experiences (e.g. courage to be oneself) and experiences of reflection take place while in a favourite place (Korpela, 1992). Thus, we will test a model (Fig. 1) where negative and positive reasons and reasons relating to the need for reflection are linked to positive or reflective experiences which, in turn, are linked to life satisfaction and perceived health.

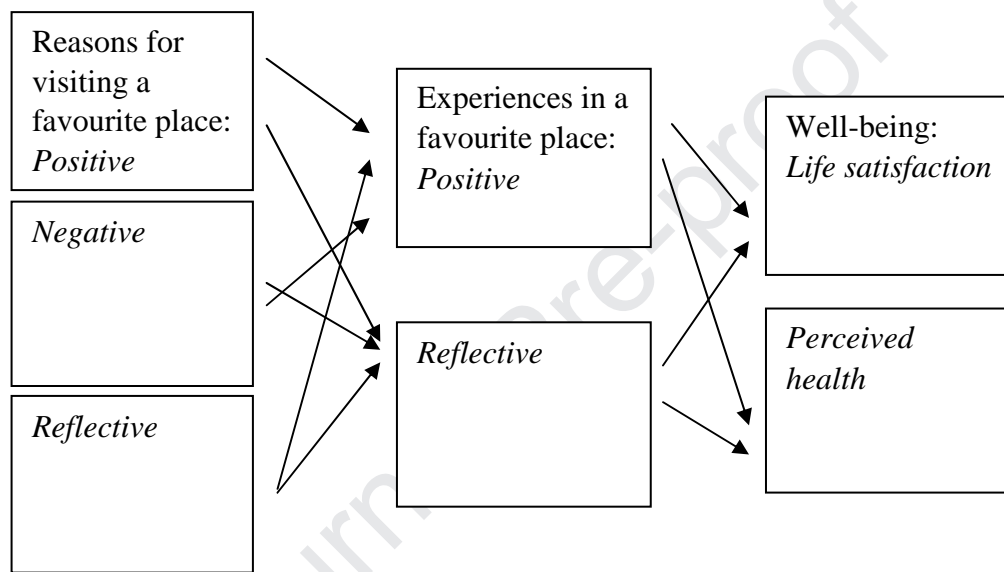


Fig. 1. Conceptual main model in the present study; in the reversed model, the arrows flow in the opposite direction and the columns of reasons and experiences change place.

No studies have tried to focus on the reversed pathway of how general well-being may be related to the reasons for visiting a favourite place. People imbue environments with meanings arising from their current needs and well-being (Degenhart et al., 2011; Kerr & Tacon, 1999; Ratcliffe & Korpela, 2016). Models of such links in relation to favourite places are lacking and we attempt to fill this research gap. Thus, the present study seeks answers to the following research questions (a-d) and hypotheses (H1-H4):

- what are the basic types/factors of the reasons for visiting the favourite place? H1: Based on earlier qualitative accounts cited in this article, we anticipate positive and negative reasons and reasons related to opportunities for reflection
- what are the basic types/factors of consequent experiences while in the favourite place? H2: According to existing qualitative accounts cited in this article, we anticipate positive and reflective experiences
- how are the reasons for visiting the favourite place related to ensuing experiences while in the



favourite place and how do these experiences, in turn, relate to well-being, i.e. life satisfaction and perceived health (the main model)? H3: There is lack of studies testing any relations between reasons, experiences and well-being but the existing qualitative accounts cited in this article suggest that all types of reasons may be related to all types of experiences and these, in turn, to both life satisfaction and perceived health. In particular, to support the idea of favourite places serving the down-regulation of negative emotions and experiences, the paths between negative reasons and positive and reflective experiences, and then, in turn, from these to well-being should be the strongest ones.

- d) how life satisfaction and perceived health are related to the reasons for visiting the favourite place and how these, in turn, relate to experiences while in the favourite place (the reversed model)? H4: There is lack of studies testing these relations but based on the studies on top-down effects cited in this article, we anticipate that both life satisfaction and perceived health are linked to all types of reasons (positively to positive and reflective reasons, negatively to negative reasons) which, in turn, are linked to both positive and reflective experiences.

## 2. Method

### 2.1 Design and procedure

We conducted cross-sectional surveys in Finland and in Hungary in a co-operation project in teaching psychology. No previous research has addressed the role of favourite places in self-regulation in Hungarian samples. Thus, the present investigation provides a cross-cultural extension to the existing literature.

In Finland, respondents were recruited in the years 2010-2017 during lectures on research methods in psychology or via e-mail lists for students. As the exact population of the e-mail lists is unknown, the overall response rate cannot be reliably evaluated. In Hungary, respondents completed the online version of the questionnaires in 2018 and were recruited through online platforms and personal networks by students on a psychology course on assessment methods for the partial fulfillment of the course requirements. Among those who opened the online invitation, 61.4% completed the whole questionnaire resulting in 483 complete cases. Translation of the assessment material into Hungarian language was done by a trained translator of Finnish origin. Moreover, a bilingual A-B translator provided a backtranslation that was discussed in multiple iterations by the first and last authors in English. The iterative translation-backtranslation process resulted in a linguistically validated version of the questionnaire package.

The participants were informed that the study was about “people’s everyday favourite place experiences” and ensured of anonymity and confidentiality in data handling. Voluntary participants filled in an internet-based questionnaire. In Finland, the students who volunteered were given course credit. The credit represented the amount of time for taking part in optional psychological investigations (a certain amount was required for course completion). The participants received no monetary compensation. The

participants gave their informed consent by filling in the questionnaire; in Finland, this met the ethical requirements for survey research. In Hungary, the authors obtained IRB ethical approval for the study prior to the assessment procedure.

The 4.5-page questionnaire took about 20 minutes to complete. For background information the respondents were asked to state their age and gender; in Hungary, additional items assessed the respondents' educational level, working hours per week (if employed), and the place of residence in Hungary (capital, town or village). The questionnaire was formulated on the basis of earlier studies on favourite place experiences emphasizing self- and emotion regulation (Korpela, 1992; Korpela & Hartig, 1996): Reasons for visiting a favourite place included negative reasons like threatening or negative experiences (disappointments, uncertainty) and conflicts (arguments with other people). Positive and supportive experiences and also internal feelings and thoughts (clearing one's mind, calming down) referring to reflection and restoration/recovery were also included as reasons (Korpela, 1992). Experiences while in a favourite place included positive experiences (pleasure, security, a sense of belonging, freeing the imagination, the courage to be oneself, autonomy, relaxation, control, privacy, escape from social pressures), corresponding negative experiences to control for response bias and experiences of reflection (sorting out one's feelings, clearing one's mind, solving problems, concentrating) while in a favourite place (Korpela, 1992).

Thus, the questionnaire contained five sections: remembering and naming a personally preferred, real, everyday favourite place (as defined by the participants), 14 structured items (+ 1 open-ended question) on the characteristics of the place, an open-ended description of the frequency of use, 19 structured items (+ 1 open-ended question) on the reasons for visiting the favourite place, 25 structured items on the experiences in the favourite place, and an open-ended question on the activities in the favourite place.

In Finland, measures of well-being were presented in a subsequent, 4-page, separate questionnaire that included sections on the use of and preferences for recreational areas, nature connectedness, nature-related hobbies, physical symptoms, satisfaction with life, everyday hassles and uplifts and self-reported health. We had no control over the time lag between the completion of the two separate questionnaires; variation ranged from one day to four months. Besides the measures of satisfaction with life and self-reported health, the Hungarian version of the questionnaire package contained additional measures of subjective well-being and mental health (perceived stress and social anxiety) which are not analysed here.

## 2.2 Participants

Table 1 presents descriptive statistics for the participants of the two separate samples for the two internet-based questionnaires by country of residence, gender and age. A total of 784 participants completed the questionnaire (n = 301 from Finland and n = 483 from Hungary).

Table 1. Descriptives of the two samples (N = 783).

	Men		Women		Age range	Mean age	Md age
	N	%	N	%	years	years	years
Finland	40	13.3	260	86.7	18-58	25.3	23
Hungary	154	31.9	329	68.1	17-86	38.9	36

## 2.3 Measures

### 2.3.1 Characteristics of the place

The main characteristics of the favourite places for the present study were whether the place was “natural” or “urban”. These were rated on a 7-point scale (0 = not at all, 6 = fully).

### 2.3.2 Reasons for visiting and experiences connected to the favourite place

Reasons for visiting the favourite place were elicited with the following question: “How important are the following situations as reasons when you go to your favourite place?”. The importance of each of the 19 items (see Table 2a) was rated on a 7-point scale (0 = not at all important, 6 = very important).

The experiences while in a favourite place were elicited with the following question: “To what degree do the following experiences describe/match your experiences while in the place?”. Each of the 25 items (see Table 2b) were rated on a 7-point scale (0 = not at all, 6 = fully). To control for response bias in the questionnaire, we also included negatively worded experiences (e.g., “Being there feels distressing”).

### 2.3.3 Subjective well-being

Satisfaction with life (SWL) was measured using the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen & Griffin, 1985; for the Hungarian version, see Martos, Sallay, Désfalvi, Szabó & Ittéz, 2014). The respondent is asked to indicate his/her agreement with five statements (e.g. “the conditions of my life are excellent”) using a 7-point scale (1 = strongly disagree, 7 = strongly agree). The SWLS has been shown to be a valid and reliable measure of life satisfaction (Pavot & Diener, 1993; Diener et al., 1985).

Perceived general health was measured by a widely-used single question “How is your health at the moment?” with response alternatives ranging from 1 (poor) to 5 (excellent) (Bronzaft, Ahern, McGinn, O’Connor & Savino, 1998). Self-rated health is reported to be a valid summary of more detailed measures of health status (Bailis, Segall, & Chipperfield, 2003), and to correspond well with longevity (Jylhä, 2009).

## 2.4 Data analysis

We used correlation analysis and exploratory factor analyses (EFA) for the preliminary analysis to identify the latent variables in the data for reasons and experiences in favourite places. For factor model estimation, we used Maximum Likelihood (ML) method with an oblique promax rotation. In EFA criteria, we used Kaiser-Meyer-Olkin (KMO) measure for sampling adequacy, the conventional eigenvalue criterion ( $>1$ ), and no  $\geq .32$  crossloadings for factors (Tabachnick & Fidell, 2007). We carried out separate EFAs in both countries (for reasons and experiences) and these yielded identical results, thereby justifying the pooling of the data for the overall EFA.

To assess associations between variables, we used structural equation modelling (SEM), where all measures were latent variables except self-reported health, which was measured with one item. The latent variables except low self-confidence, distress (skewness = 1.87) were only moderately skewed ( $< 1$  or  $> -1$ ) (sad, depressed skewness = 0.01, happy, well skewness = - 0.42, alone, reflective skewness = - 0.39, positive recovery of self skewness = - 0.90, life satisfaction skewness = - 0.47), which allowed us to perform SEM. To account for potential cultural differences, a country variable was included and thus controlled for in the models.

In SEM, the covariance matrix was estimated with ML method presupposing multivariate normality of the variables. This method produces a positive definite estimate of the covariance matrix, also in the case of missing data. The covariance matrix was first estimated taking into account missing at random (MAR) values (function `mlemt` in R). The result was identical with the estimates of complete case analysis, which is used for the models, resulting in  $N = 576$ ; only well-being measures include missing data. There were no outliers in this data. In all models, the latent factors were allowed to correlate with each other. The model fits were assessed according to Kline's (2016) recommendations: the non-significance of the  $\chi^2$  test, Root Mean Square Error of Approximation (RMSEA) with values smaller than 0.06 – 0.08, Bentler Comparative Fit Index (CFI) with values greater than 0.90 or .95, and Standardized Root Mean Square Residual (SRMR) with values smaller than 0.08 indicating a good fit (Schreiber, Nora, Stage, Barlow, & King, 2006). We also report a parsimony fit index Parsimonious Normed Fit Index (PNFI). We note, however, that the  $\chi^2$  statistic nearly always rejects the model when large samples are used and that for PNFI, no threshold levels have been recommended (Hooper, Coughlan & Mullen, 2008).

All analyses were conducted with R –program, version 3.5.1 and library Lavaan. The required sample size for EFA and ML method in SEM was set at the recommended minimum of 500 people (Tabachnick & Fidell, 2007). To check the sufficiency of this, in *a priori* power analysis, the required number of observations through RMSEA = .05, power = .80,  $p = .05$ , resulted in  $N = 176$  for the main model and in  $N = 174$  for the reversed model.

### 3. Results

### 3.1 Favourite places

We obtained frequencies for the main types of favourite places by combining the rating scale values 6 (very much) and 7 (fully) for “urban” and “natural” characteristics. This resulted in 438 (56%) natural places and 184 (23%) urban places, leaving 162 (21%) places as “mixed natural and urban”.

### 3.2 Correlations

Table 2a shows that, in general, the importance of positive and negative reasons correlate significantly. Specifically, the importance of feeling powerful before visiting the favourite place is related to all positive and negative reasons. Exceptions are the importance of depression and quarrels as reasons, which do not correlate with the importance of happiness and good mood. Positive reasons are related more positively and with larger coefficient eigenvalues than negative reasons to both life satisfaction and perceived health. The importance ratings of depression, sadness, rejection, setbacks and quarrels as reasons are exceptions with significant negative correlations to life satisfaction.

Table 2b reveals that experiences of decreased self-confidence, distressing feelings and difficulties in accepting oneself are negatively related to both life satisfaction and perceived health. On the other hand, becoming cheerful has a significant positive relationship to both life satisfaction and perceived health.

The correlations between reasons and experiences (Table 2c) are mainly significant and positive. Non-significant correlations appear mainly between neutral (affected, alone, reflection) or positive reasons (Table 2c; columns h-n) and negative self-conception (Table 2c; rows 10, 16) or distressed mood (row 11). Overall, correlation Tables 2a-c (online appendices) provide an appropriate starting point for SEM analyses to answer research questions c and d.

### 3.3 Exploratory factor analyses

On the basis of the EFA of reasons for visiting the favourite place (Table 3), four items were excluded due to low communalities or double loadings (“when being infatuated with someone”, “having had a stroke of luck”, “when wanting to calm down”, “when wanting some action”). In line with the first hypothesis (H1), the solution included three factors explaining 68% of the total variance. The first factor “Sad, depressed” included negative reasons, such as sadness, depressive mood or feelings of rejection. The second factor “Happy, well” included positive reasons, such as being very happy and in a good mood. The third factor “Alone, reflective” includes desires to be alone and ponder on issues. Repeated ANOVA (Greenhouse-Geisser correction) of the factors’ mean summary scores was significant ( $F_{(2,1564)} = 166.6, p < .001$ ; partial  $\eta^2 = .18$ ) and Bonferroni comparisons confirmed that “Alone” and “Happy” reasons were significantly more important than “Sad” reasons for visiting the favourite place (both  $p$ ’s  $< .001$ ). The factor correlations show that negative reasons in particular relate to the wish to be alone and reflect in the favourite

place. Those who visit a favourite place for negative reasons tend also to visit it for positive reasons (Table 2a, Table 3).

Table 3. EFA of the reasons for going to a favourite place (MLE, promax).

Reason	I Sad, depressed	II Happy, well	III Alone, reflective	$h^2$
when sad	.98			.85
when depressed	.94			.79
someone has left/rejected me	.88			.69
after having a quarrel with someone	.86			.65
having had setbacks	.76			.66
when insecure about myself	.69			.63
when angry	.69			.55
when being affected	.50			.46
when very happy		.97		.85
when everything goes well		.90		.77
when in a good mood		.82		.63
when feeling powerful		.58		.44
when wanting to be alone			.88	.72
when wanting to reflect on issues			.82	.65
Eigenvalue	5.17	2.89	1.48	
Cumulative explained variance %	36.9	57.5	68.1	
Mean summary score (SD) of the factor	2.43 (1.74)	3.52 (1.53)	3.59 (1.99)	
Reliability (Cronbach $\alpha$ )	.93	.87	.80	
Factor correlations	I	.32	.68	
	II		.35	

Note: loadings <.30 are not shown; KMO = .92;  $h^2$  = communality

Table 4. EFA of experiences in a favourite place (MLE, promax).

Experience: "There..."	Positive recovery of self	Low self-confidence, distress	$h^2$
I feel I am a unique and valuable person.	.68		.46
I can recover to be myself after something has touched/affected me.	.67		.45
I can dream and wish to accomplish personally important and pleasant aspirations.	.67		.45
Threatening matters or disappointments transform in a more positive and brighter direction while there.	.67		.44
I can order difficult and worrisome matters in my mind.	.67		.44

I can be free of unpleasant mental strain and excitement.	.66		.46
I feel safe.	.65		.45
I can ponder future threats or problems and anticipate solutions to them.	.64		.41
I can see myself from a positive perspective.	.64		.43
I can have control over my feelings and experiences.	.61		.38
I feel I belong there.	.58		.33
The image of myself changes while there.	.56		.34
The place affects my mental state.	.49		.25
I always become cheerful.	.41	-.36 <sup>a</sup>	.31
I feel that my self-confidence decreases.		.74	.55
Being there feels distressing.		.68	.47
My mood turns gloomy when I go there.		.61	.39
I feel a failure there.		.57	.32
I have difficulty in accepting myself as I am while there.		.56	.32
I feel I am losing my self-control.		.52	.27
The place restricts my autonomy.		.39	.15
Eigenvalue	5.35	2.72	
Cumulative explained variance %	25.5	38.4	
Mean summary score (SD) of the factor	3.97 (1.1)	.50 (.68)	
Reliability (Cronbach's $\alpha$ )	.89	.77	
Factor correlation		-.06	

Note: a: The cheerfulness item was included in the positive recovery factor; loadings  $<.30$  are not shown; KMO = .92;  $h^2$  = communality

In the EFA for experiences in the favourite place (Table 4), all items were retained in a two-factor solution explaining 38% of the variance. The first factor describes "Positive recovery of self" and the second factor comprising negative experiences can be labelled as "Low self-confidence and distress". This result differs from the second hypothesis (H2) as reflection was included in the first factor and the second factor consists of negative experiences. Paired samples t-test of the factors' mean summary scores revealed that, on average, positive recovery experiences were significantly more descriptive of the favourite place experiences than low self-confidence and distress experiences ( $t_{(781)} = 74.6$ ,  $p < .001$ ).

### 3.4 Structural equation models



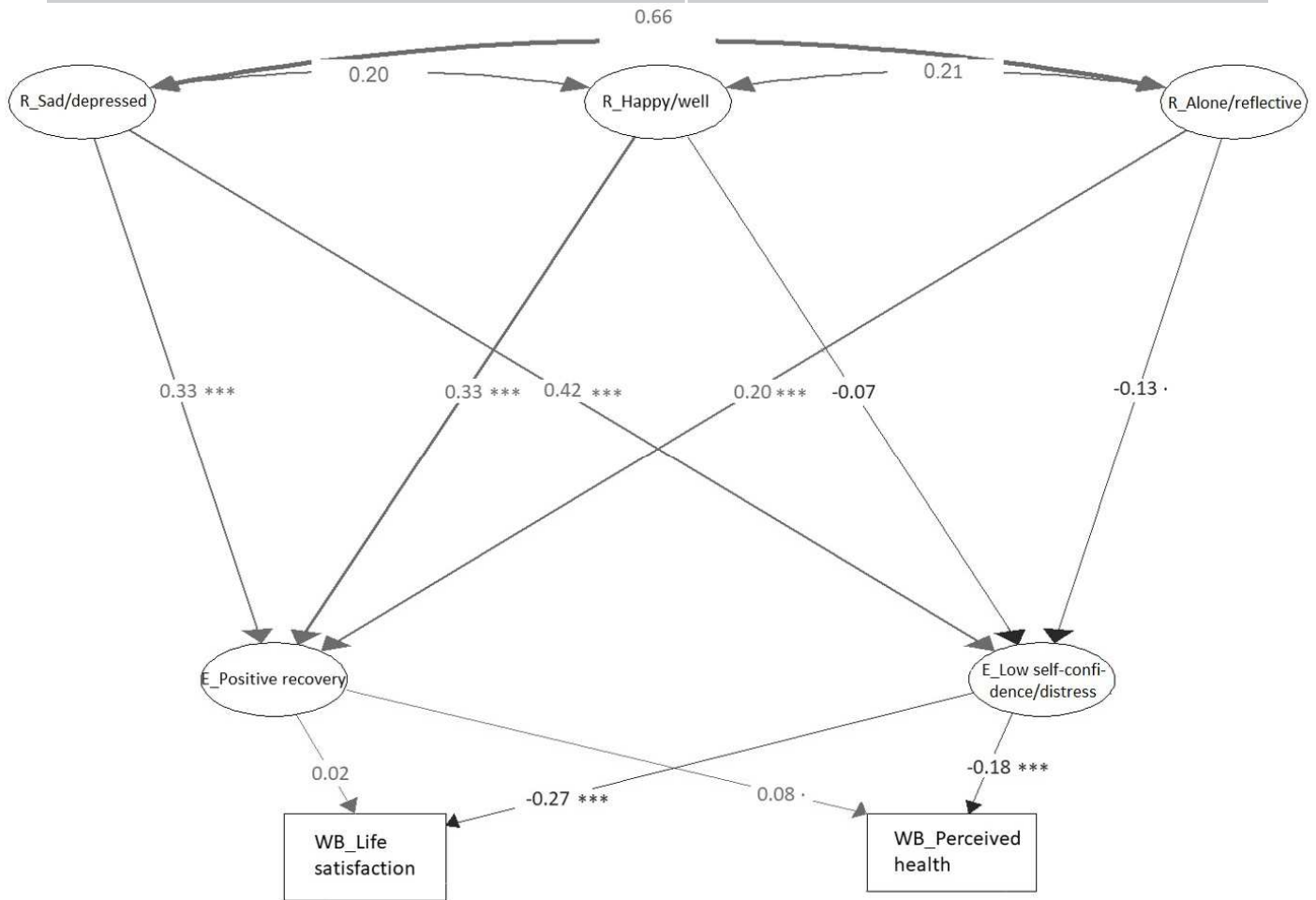


Figure 2. The main model (N = 576). Note: (dot) .  $p = 0.05-0.1$ , \*  $p = 0.01-0.05$ , \*\*  $p = 0.001-0.01$ , \*\*\*  $p < .001$ .

The main model in Fig. 2 shows that all of the three reasons (“Sad, depressed”; “Happy, well”; “Alone, reflective”) for visiting the favourite place were significantly and positively related to the experiences of positive recovery of self ( $\beta = .20-.33$ ). Sad and depressed reasons were positively related to the recovery experiences ( $\beta = .33$ ) and with a larger coefficient to the low self-confidence and distress experiences ( $\beta = .42$ ).

Happiness as a reason for going to a favourite place was significantly related to experiences of positive recovery ( $\beta = .33$ ) but not to experiences of distress. The desire to withdraw to a favourite place alone or to reflect was significantly related to the experiences of positive recovery of self ( $\beta = .20$ ) but not to the experiences of low self-confidence and distress. Experiences of positive recovery were not related to measures of well-being. Thus, H3 was only partially supported as not all types of reasons were related to all types of experiences. In particular, paths between negative reasons, positive (and reflective) experiences, and well-being did not emerge as the strongest ones as expected. Instead, experiences of distress in a favourite place were negatively related to both life satisfaction ( $\beta = -.27$ ) and to perceived health ( $\beta = -.18$ ); the more salient the experiences of distress in a favourite place, the lower life satisfaction and perceived health.



The model explained more variation in positive recovery ( $R^2 = .42$ ) and experiences of distress ( $R^2 = .18$ ) than in measures of well-being ( $R^2 = .04-.07$ ). The model fit indices indicated mediocre fit with the data, as  $\chi^2 = 2374$  ( $df = 650$ ,  $p < .001$ ),  $RMSEA = .07$ ,  $CFI = .84$ , and  $SRMR = .09$ .

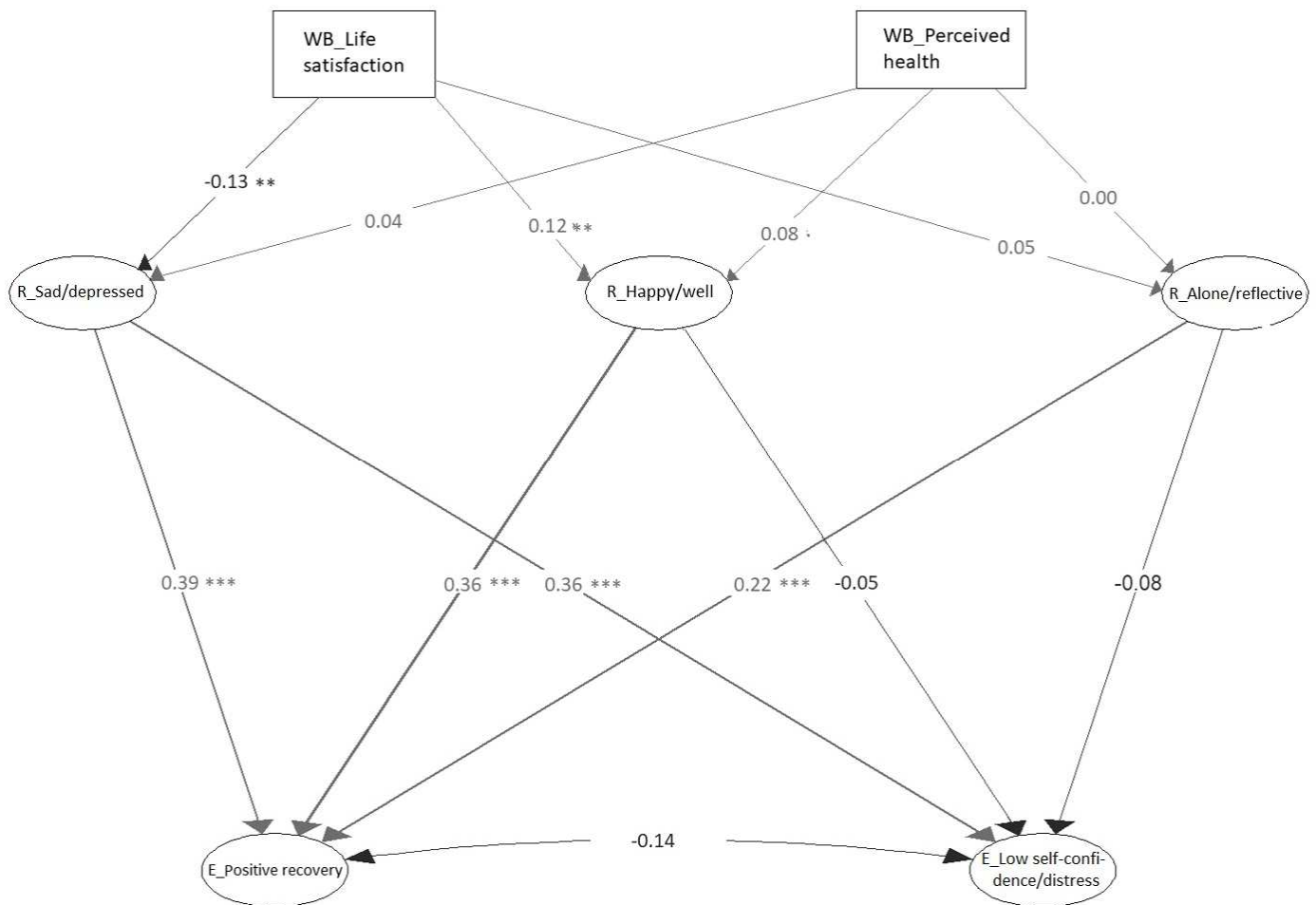


Figure 3. The reversed model ( $N = 576$ ). Note: (dot)  $p = 0.05-0.1$ , \*  $p = 0.01-0.05$ , \*\*  $p = 0.001-0.01$ , \*\*\*  $p < .001$ .

The reversed model (Fig. 3) shows that life satisfaction was significantly associated with two sets of reasons for going to a favourite place (sad, depressed and happy, well) and perceived health with none. The more satisfied with life a person was, the more important were happy feelings as a reason for going to a favourite place ( $\beta = .12$ ) and the less important were depressed and sad feelings ( $\beta = -.13$ ) as reasons.

Analogous to the main model, the sad and depressed reasons were related both to experiences of positive recovery ( $\beta = .39$ ) and to experiences of distress ( $\beta = .36$ ). Happy feelings as a reason for going to a favourite place were positively related to experiences of recovery ( $\beta = .36$ ) but not to experiences of distress. The desire to withdraw to a favourite place alone or to reflect was positively related to experiences of recovery of self ( $\beta = .22$ ) but not related to experiences of distress.

In all, H4, anticipating a link between both life satisfaction and perceived health and all types of reasons (positively to positive and reflective reasons, negatively to negative reasons) and experiences was not supported.

The reversed model explained more variation in recovery ( $R^2 = .32$ ) and distress ( $R^2 = .23$ ) experiences than in reasons ( $R^2 = .03-.11$ ). The model fit indices indicated mediocre fit with the data, as  $\chi^2 = 2559$  ( $df = 647$ ,  $p < .001$ ),  $RMSEA = .07$ ,  $CFI = .82$ , and  $SRMR = 0.12$ .

#### 4. Discussion

We aimed to investigate the types of reasons for visiting favourite places, experiences while there, their mutual interconnections and connections to perceived well-being. In line with earlier studies (Laatikainen et al., 2017; Newell, 1997), the majority (56%) of favourite places in this adult sample were natural settings.

In a correlational analysis, we found that people tend to use favourite places on both negative and positive occasions as the importance of positive and negative reasons generally correlated significantly. The majority of the reasons and experiences were related to each other and several reasons and experiences (among those measured in the present study) were related to the well-being variables of life satisfaction and perceived health. Although causal directions cannot be specified, this supports the general idea of self-regulation and up- and down-regulation of emotion taking place in favourite places and being related to well-being.

The questionnaire was formulated on the basis of existing qualitative accounts of favourite place experiences (Korpela, 1992; Korpela & Hartig, 1996) and revealed the factors of being “sad and depressed”, being “happy and well”, and the desire to “be alone and reflect” on issues. Thus, the themes of emotion regulation and reflection were evident. However, visiting a favourite place in cases of sadness and depressive mood were rated, on average, as less important reasons than withdrawal or positive mood. The current factor solution is not exhaustive (e.g. the need to calm down or process disappointments did not fit with the factor solution) and future studies to ascertain the reasons (i.e. situations, emotions and cognitions) in full are called for.

The experiences while in a favourite place formed two factors “positive recovery of self” and “low self-confidence and distress” revealing a dichotomy of positive vs. negative or pleasant vs. unpleasant experiences. The first factor refers to successful self-regulation, i.e. to positive change of experiences related to the self (e.g. “I can recover to be myself...”) and the ability to reflect on personally important issues. In addition to these, the pleasant feelings of release from strain, control over feelings, safety and belongingness loaded on this factor. The second factor contains negative experiences related to the self and negative mood/feelings. It contains experiences of decreased self-confidence, lower acceptance of oneself, decreased

self-control and autonomy and also experiences of distress and gloominess. Thus, it seems that the positive and negative feelings on these two factors are closely related to the self-experience of the person as the feelings did not form a factor of their own. To summarize, the entirety of reason and experience factors reveals ingredients for the regulation of positive and negative self-experiences and feelings and the desire to cognitively reflect on issues in solitude. As the present factor solutions did not include purely restorative experiences in line with major restoration theories (SRT by Ulrich et al., 1991; ART by R. & S. Kaplan, 1989) neither in the factor items nor in the outcome measures – except for reflection –, a need for future studies to compare such restorative experiences with self-regulative experiences in favourite places is evident.

The structural equation models achieved only a mediocre fit with the data. The model fits were comparable for the main and reversed models although the main model explained variance in experiences of “positive recovery of self” slightly more ( $R^2 = .42$ ) than the reversed model ( $R^2 = .32$ ). Thus, we find some support for but not proof of the tenability of the ideas of environmental self-regulation and reversed associations. Moreover, the results provide prospects for further research in this area.

In SEM models, not only positive (“happy, well”) and reflective (“alone, reflection”) reasons but also negative reasons (“sad, depressed”) for visiting the favourite place were significantly and positively related to the experiences of “positive recovery of self”. This indicates that favourite places do indeed serve self-regulation by transforming negative feelings into positive feelings. This confirms earlier findings (Korpela & Ylén, 2007) but is still a cross-sectional finding necessitating longitudinal studies in the future. However, negative reasons (“sad, depressed”) were more strongly related to experiences of low self-confidence and distress than to positive recovery of self. Thus, negative experiences as reasons do not necessarily change in the favourite place but remain negative. Not surprisingly, negative experiences in favourite places were, on average, on a very low level (mean summary score of the factor), meaning that they did not closely match with people’s experiences in favourite places. Further studies are needed to qualify the circumstances in which negative experiences change to positive or remain negative. The situation is analogous to coping research, where the question of the ways in which coping affects different outcomes in both short and long term has remained challenging (Folkman & Moskowitz, 2004).

The desire to withdraw to a favourite place alone or to reflect was significantly related to positive recovery experiences of self but not to experiences of low self-confidence and distress. This again refers to the successful use of favourite places in the service of self-regulation so that emotionally neutral experiences – the desire to be alone or to reflect – may turn to positive experiences of recovery of self. The finding suggests a sequence or co-occurrence of different affect regulation or coping strategies which deserves separate research efforts (Korpela et al., 2018). Happiness as a reason for going to a favourite place was significantly related to experiences of positive recovery but not to experiences of distress. Thus, certain positive feelings can be maintained in a favourite place and are not likely to turn into negative, distressed feelings. This confirms a previous qualitative observation from adolescents (Korpela, 1992).

Contrary to our expectations, positive experiences of recovery of self were not related to well-being. Consequently, we found no evidence of successful environmental self-regulation (negative reasons relating to positive experiences) being related to life satisfaction and perceived health. This is contrary to an earlier study, where perceived frequency of use and efficacy of urban or nature walks or favourite places for affect regulation were positively related to perceived health (Korpela et al., 2018). The difference in the results may stem from a mismatch between generality or time frame in the environmental vs. well-being items. Perceived health and life satisfaction refer to aggregated, stable assessments, whereas experiences in the favourite places in the present study might have been interpreted as referring to an isolated visit (“how important are these reasons”/ “how do these match your experiences while in the place”). In the earlier study, the environmental items were on a more aggregated level (“how frequently do you use that behaviour to influence your feelings?”) which may have matched perceived health assessment better. Moreover, common method variance is a problem in both studies, thereby compromising the reliability of the results. This necessitates further research on other aspects of well-being with different temporal rates of change, such as stress-restoration (Kaplan & Kaplan, 1989; Ulrich et al., 1991), vitality (Ryan et al., 2010), eudaimonic well-being (Ryan & Deci, 2001) or positive mental health (Tennant et al., 2007). One further explanation for the present result may be that our measure of favourite place experiences had only a few emotion-related items and several items focused on reflection and self-related experiences instead. It is known that positive affect reduces stress and positively affects coping and health (Pressman, Jenkins & Moskowitz, 2019). In this sense, it is noteworthy that the single items of feeling well or happy as reasons for visiting a favourite place and the experience of becoming cheerful were all positively and significantly related to both life satisfaction and perceived health. Conversely, the more salient the distress experiences in a favourite place, the lower were life satisfaction and perceived health. Thus, we may assume that if self-regulation in a favourite place does not succeed in converting negative self-experience or affects positive ones, the consequences for life satisfaction and perceived health may be negative. Further studies may ascertain the question whether experiences of low self-confidence and self-disintegration and negative feelings in a favourite place can be regarded as a failure of self-regulation or, at least in some instances, a step in a longer process of recovery. Here, the use of other, validated measures of emotion and self-regulation failures in subsequent studies would be an important next step. The frequency of use of favourite places may mediate or moderate these relationships and as this was not taken into account in the present study, future studies clarifying this issue are needed. Moreover, this finding points to the potential need for guidance and education in using environments to support self- and emotion regulation (cf. Pasanen, Johnson, Lee & Korpela, 2018).

As country was controlled for in our analyses, it would be important to check the model invariances across countries and subsamples. Furthermore, although our sample had a fairly wide age range, it consisted mainly of university students and the majority of the participants were female. We do concede that age and gender may moderate our results but the exact effects of this are difficult to estimate. There is evidence that

age and gender moderate landscape preferences (Sevenant & Antrop, 2010) and that in real-life place evaluations safety issues may matter more to females than males. However, there is also reason to believe that the safety restrictions often reported by females do not as such influence the choice of places (as investigated in the present study) but rather visiting those places in company rather than alone or during daylight hours rather than in the hours of darkness (Jorgensen et al., 2007). Furthermore, some studies have reported gender differences in well-being and health at different levels of exposure to nature but the results are inconsistent (Korpela, de Bloom & Kinnunen, 2015). All in all, the present results must be interpreted with caution and cannot be generalized to any other population groups or cultural contexts.

As the cross-sectional design of the study does not allow causal inferences, we also analysed the reversed direction of well-being affecting the use of favourite places. The reversed model showed that life satisfaction is significantly associated with two sets of reasons for going to a favourite place (“sad, depressed” and “happy, well”) and perceived health to none. The more satisfied with life a person was the more important were happy feelings as a reason for going to a favourite place and the less important were depressed and sad feelings as reasons. This indicates a top-down effect of life satisfaction by increasing the importance of positive reasons and decreasing the importance of negative ones for going to a favourite place. Such findings complement research where life satisfaction is regarded as an important predictor of advantageous daily experiences, such as better momentary affect and less stress (Smyth, Zawadzki, Juth & Sciamanna, 2017) or future life outcomes (Diener, 2012).

## References

- Alcock, I., White, M. P., Wheeler, B. W., Fleming, L. E., & Depledge, M. H. (2014). Longitudinal effects on mental health of moving to greener and less green urban areas. *Environmental Science & Technology*, 48, 1247–55. doi: 10.1021/es403688w
- Bailis, D. S., Segall, A., & Chipperfield, J. G. (2003). Two views of self-rated general health status. *Social Science & Medicine*, 56, 203–217. [http://doi.org/10.1016/S0277-9536\(02\)00020-5](http://doi.org/10.1016/S0277-9536(02)00020-5)
- Bronzaft, A. L., Ahern, K. D., McGinn, R., O'Connor, J., Savino, B., 1998. Aircraft noise: A potential health hazard. *Environment & Behavior*, 30, 101-113.
- Cicchetti, D., Ganiban, J., & Barnett, D. (1991). Contributions from the study of high-risk populations to understanding the development of emotion regulation. In J. Garber & K. A. Dodge (Eds.), *The development of emotion regulation and dysregulation* (pp. 15-48). Cambridge: Cambridge University Press.
- Cohen-Cline, H., Turkheimer, E., & Duncan, G. E. (2015). Access to green space, physical activity and mental health: A twin study. *Journal of Epidemiology and Community Health*, 69, 523–529. doi: 10.1136/jech-2014-204667
- Diener, E. (2012). New findings and future directions for subjective well-being research. *American Psychologist*, 67, 590-597.
- Diener, E., Emmons, R. A., Larsen, R. J. & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49, 71-75.



- Dodge, K. A., & Garber, J. (1991). Domains of emotion regulation. In J. Garber & K. A. Dodge (Eds.), *The development of emotion regulation and dysregulation* (pp. 3-11). Cambridge: Cambridge University Press.
- Folkman, S., & Moskowitz, J. T. (2004). Coping: Pitfalls and P?romise. *Annual Review of Psychology*, 55, 745-774.
- Frijda, N. (1986). *The emotions*. Cambridge: Cambridge University Press.
- Hartig, T., Mitchell, R., de Vries, S., & Frumkin, H. (2014). Nature and health. *Annual Review of Public Health*, 35, 207-228. doi:10.1146/annurev-publhealth-032013-182443
- Hooper, D., Coughlan, J. & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *The Electronic Journal of Business Research Methods*, 6, 53 – 60.
- Johnsen, S. Å. K. (2013). Exploring the use of nature for emotion regulation: Associations with personality, perceived stress, and restorative outcomes. *Nordic Psychology*, 65, 306-321.
- Johnsen, S. Å. K., & Rydstedt, L. W. (2013). Active use of the natural environment for emotion regulation. *Europe's Journal of Psychology*, 9, 798–819. doi:10.5964/ejop.v9i4.633
- Jorgensen, A., Hitchmough, J., & Dunnett, N. (2007). Woodland as a setting for housing-appreciation and fear and the contribution to residential satisfaction and place identity in Warrington New Town, UK. *Landscape and Urban Planning*, 79, 273–287. <http://doi.org/10.1016/j.landurbplan.2006.02.015>
- Jylhä, M. (2009). What is self-rated health and why does it predict mortality? Towards a unified conceptual model. *Social Science & Medicine*, 69, 307–316. <http://doi.org/10.1016/j.socscimed.2009.05.013>
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. Cambridge: Cambridge University Press.
- Kerr, J. H., & Tacon, P. (1999). Psychological responses to different types of locations and activities. *Journal of Environmental Psychology*, 19, 287-294.
- Kline, R. B. (2016). *Principles and Practice of Structural Equation Modeling. Methodology in the Social Sciences*, 4th Ed. New York, NY: Guilford Press.
- Korpela, K. (1992). Adolescents' favourite places and environmental self-regulation. *Journal of Environmental Psychology*, 12, 249-258.
- Korpela, K., & Hartig, T. (1996) Restorative qualities of favorite places. *Journal of Environmental Psychology*, 16, 221-233.
- Korpela, K. M., Hartig, T., Kaiser, F. G., & Fuhrer, U. (2001) Restorative experience and self-regulation in favorite places. *Environment & Behavior*, 33, 572-589.
- Korpela, K., De Bloom, J., & Kinnunen, U. (2015). From restorative environments to restoration in work. *Intelligent Buildings International*, 7, 215-223. doi: 10.1080/17508975.2014.959461
- Korpela, K. M., Pasanen, T., Repo, V., Hartig, T., Staats, H., Mason, M., Alves, S., Fornara, F., Marks, T., Saini, S., Scopelliti, M., Soares, A.L., Stigsdotter, U. K., & Ward Thompson, C. (2018). Environmental strategies of affect regulation and their associations with subjective well-being. *Frontiers in Psychology / Environmental Psychology*, 9, 562. doi: 10.3389/fpsyg.2018.00562
- Korpela, K. & Ylén, M. (2007). Perceived health is associated with visiting natural favourite places in the vicinity. *Health & Place*, 13, 138–151. doi:10.1016/j.healthplace.2005.11.002
- Laatikainen, T. E., Broberg, A., & Kytä, M. (2017). The physical environment of positive places: Exploring differences between age groups. *Preventive Medicine*, 95, S85–S91.
- Martos, T., Sallay, V., Désfalvi, J., Szabó, T., & Ittész, A. (2014). Az Élettel való Elégedettség skála magyar változatának (SWLS-H) pszichometriai jellemzői [Psychometric characteristics of the Hungarian version of the Satisfaction with Life Scale (SWLS-H)]. *Mentálhigiéne és Pszichoszomatika*, 15, 289-303. doi: 10.1556/Mental.15.2014.3.9

- McMahan, E. A., & Estes, D. (2015). The effect of contact with natural environments on positive and negative affect: A meta-analysis. *The Journal of Positive Psychology*, 10, 507–519. doi: 10.1080/17439760.2014.994224
- Newell, P. B., (1997). A cross-cultural examination of favourite places. *Environment & Behavior*, 29, 495–514.
- Pasanen, T., Johnson, K., Lee, K., & Korpela, K. (2018). Can nature walks with psychological tasks improve mood, self-reported restoration, and sustained attention? Results from two experimental field studies. *Frontiers in Psychology / Environmental Psychology*, 9, 2057.
- Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Personality Assessment*, 5, 164–172.
- Pressman, S. D., Jenkins, B. N., & Moskowitz, J. T. (2019). Positive affect and health: What do we know and where next should we go? *Annual Review of Psychology*, 70, 627–650.
- Ratcliffe, E., & Korpela, K. M. (2016). Memory and place attachment as predictors of restorative perceptions of favourite places. *Journal of Environmental Psychology*, 48, 120–130.
- Ratcliffe, E., & Korpela, K. M. (2018). Time- and self-related memories predict restorative perceptions of favorite places via place identity. *Environment & Behavior*, 50, 690–720.
- Richardson, E. A., & Mitchell, R. (2010). Gender differences in relationships between urban green space and health in the United Kingdom. *Social Science & Medicine*, 71, 568–575. doi:10.1016/j.socscimed.2010.04.015
- Russell, J. A., & Snodgrass, J. (1987). Emotion and the environment. In D. Stokols, & I. Altman (Eds.), *Handbook of environmental psychology* (Vol. 1, pp. 245–280). New York: John Wiley.
- Ryan, R.M. & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, 52, 141–166.
- Ryan, R. M., Weinstein, N., Bernstein, J., Brown, K. W., Mistretta, L., & Gagné, M. (2010). Vitalizing effects of being outdoors and in nature. *Journal of Environmental Psychology*, 30, 159–168.
- Scannell, L., & Gifford, R. (2017). The experienced psychological benefits of place attachment. *Journal of Environmental Psychology*, 51, 256–269.
- Schreiber, J. B., Stage, F. K., King, J., Nora, A., & Barlow, E. A. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *Journal of Education Research*, 99, 323–337. <http://dx.doi.org/10.3200/JOER.99.6.323-338>.
- Sevenant, M., & Antrop, M. (2010). The use of latent classes to identify individual differences in the importance of landscape dimensions for aesthetic preference. *Land Use Policy*, 27, 827–842.
- Smyth, J.M., Zawadzki, M. J., Juth, V., & Sciamanna, C. N. (2017). Global life satisfaction predicts ambulatory affect, stress, and cortisol in daily life in working adults. *Journal of Behavioral Medicine*, 40, 320–331.
- Stigsdotter, U. K., Ekholm, O., Schipperijn, J., Toftager, M., Kamper-Jørgensen, F., & Randrup, T. B. (2010). Health promoting outdoor environments - Associations between green space, and health, health-related quality of life and stress based on a Danish national representative survey. *Scandinavian Journal of Public Health*, 38, 411–417. doi:10.1177/1403494810367468
- Sugiyama T., Leslie E., Giles-Corti B., & Owen N. (2008). Associations of neighbourhood greenness with physical and mental health: do walking, social coherence and local social interaction explain the relationships? *Journal of Epidemiology & Community Health*, 62, e9. doi:10.1136/jech.2007.064287
- Tabachnick, B. G., & Fidell, L. S. (2007) *Using multivariate statistics*. Boston: Pearson.
- Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Development and UK validation. *Health and Quality of Life Outcomes*, 5, 63.

Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 11, 201-230.



## **Environmental self-regulation in favourite places of Finnish and Hungarian adults**

Running title: Self-regulation in favourite places

### **Highlights:**

We investigated the self-reported benefits of favourite physical places for well-being.

Favourite places were visited for depressed, happy and reflective reasons.

Positive recovery of self but also distress was experienced in favourite places.

Positive recovery experiences were not related to well-being.

Distress experiences were negatively related to life satisfaction and perceived health.

Life satisfaction was related to positive and negative reasons.